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S U R G I C A L C A S E S,

WITH OBSERVATIONS.

BY

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SURGICAL CASES.

I HAVE selected the following from cases occurring in my practice, principally as they seem to me to illustrate some points in surgical pathology, and to possess interest in a practical point of view :—

CASE I.—*Osteo-sarcoma of Forearm ; Amputation ; Recovery.*

On the 4th of March, 1852, I was requested by Dr Cruickshank of North Berwick, to visit with him, Elizabeth Watt, residing at Williamston, who was affected with a large tumour of the forearm.

About eight years previously she had first observed a small firm swelling a little above the wrist, which continued to increase gradually and slowly, without much pain or inconvenience. About four years prior to my seeing her she had become alarmed about the tumour, and applied to Dr Cruickshank, who recognised the disease as osteo-sarcoma. The swelling at that time was about the size of an egg, limited distinctly to the lower end of the ulna, and had begun to interfere with the motions of the forearm and wrist. Dr Cruickshank advised her to submit to amputation at the middle of the forearm ; but the patient and her friends would not listen to the proposal, and applied for assistance to other practitioners. A variety of remedies, both general and local, seem to have been used, but without any good result. At last she fell into the hands of a bone doctor, and, as far as can be judged from her description of the treatment, he seems to have applied first a strong tincture of iodine, and ultimately some form of escharotic to the tumour, which gave rise to ulceration at one point, and still more rapid increase of volume, profuse discharge, pain, and great constitutional disturbance. She returned home, the tumour having attained an enormous size, and her general health completely undermined by the hectic induced by the profuse discharge and pain. Dr Cruickshank now saw her again, and he found her anxious to submit to any operation to obtain relief.

At my first visit she was lying in bed with the enormous solid tumour supported on a pillow : it felt of the consistence of bone, with here and there softer points, the superficial veins were enormously enlarged, the fingers were firmly clenched, and the nails were elongated and curved like elaws. A large, deep, ulcerated cavity in the tumour displayed portions of its osseous substance partly dead, and mixed with unhealthy discharge, and emitting a most insupportable fetor. Her general appearance indicated an extreme degree of debility : she was excessively emaciated, with sunk, anxious features, small, rapid pulse, etc. On examining the axilla, I found decided enlargement of one or two glands.

The extremely debilitated condition of the patient, together with the enlarged glands in the axilla, and the rapid growth latterly of the tumour, taken in connection with her cachectic look, seemed to militate against amputation ; but, on the other hand, the originally simple character of the tumour, its slow progress up to the time of being irritated by stimulating applications, and its still

retaining a solid osteo-sarcomatous appearance, together with the consideration that the mere irritation produced by the ulcerated portion was sufficient to cause enlargement of the axillary glands, and that its removal, though only as a temporary alleviation of her suffering, would be a boon to the patient, made me decide on amputating. Dr Cruickshank having put the patient under chloroform, I removed the arm by double flap a little below the insertion of the deltoid. There was great venous hemorrhage in making the incisions, and the blood flowed in a stream from the veins of the tumour, even after the bone was sawn through.

Six or seven arteries required ligature. After the patient was put in bed she was excessively weak, but gradually revived. An opiate was ordered to be given after the effects of the chloroform had passed off.

I visited her again on the fourth day after the amputation. The stump was looking well, and her general appearance much improved. Her pulse was under 90, and she had slept well ever since the operation. I continued to see her from time to time. The greater part of the stump was soon firmly healed. About the tenth day a large abscess formed in the axilla and over the pectoral muscle; this was opened, and, as it was diffuse, a counter opening was made in the arm. Under careful treatment she continued to improve, and was soon able to get up and go out.

I saw her in March 1854, in excellent health, and examined the stump and axilla carefully. There was not the slightest trace of any tendency to reproduction of the disease, and she still continues in perfect health.

The tumour, when removed, was found to weigh eight pounds and a half; its length was fourteen inches, its greatest circumference, corresponding to about the middle of the forearm, was eighteen inches, immediately above the wrist sixteen inches, and near the elbow twelve inches. It consisted almost entirely of osseous matter, with an admixture of soft fibro-cartilaginous-looking deposit. The great vessels and nerves of the forearm, together with the muscles and tendons, passed into and through the tumour, or formed grooves for themselves, more or less deep, as represented in the accompanying plate. The diseased growth seemed limited at each extremity by the articular cartilage; but, although commencing distinctly in the ulna, the disease had progressed laterally so as to blend the shafts of the ulna and radius inseparably into one general mass. Neither the humerus superiorly nor the carpus inferiorly were implicated, but the cartilage of incrustation of the bones of the forearm was partially absorbed. The veins on the surface of the tumour were of enormous size, as seen during its dissection.

Remarks.—The foregoing case, independently of the enormous size of the tumour, has interest in a practical point of view in reference to the pathology of similar growths. 1st. The slow progress in development whilst left alone, compared with the rapid increase in volume when the use of deobstruent remedies were had recourse to in the vain hope of dissolving the tumour. During the four years which the tumour had existed prior to her showing it to Dr Cruickshank it had only attained the size of an egg, and it was some time after he had recommended its removal by operation that the patient applied for advice to others, and commenced the use of remedies to promote its dissolution. Yet, under such treatment, it increased to the enormous size it ultimately attained in a shorter period than it took to reach the comparatively small size of an egg when left to its own natural progress. The period, however, from which the constitution became affected was after the application of the escharotic which had caused the ulceration of the tumour.

This can be readily accounted for by the local irritation produced by the ulceration of the opened out texture of the osseous tumour, the necrosis of portions of it which took place, and the profuse discharge consequent on these conditions. The history of the case in this respect may serve to enforce the good practical rule that in cases of tumours where removal by operation is objected to by the patient or deemed inexpedient, the safest plan is to refrain from meddling treatment.

Another point of interest is to determine how far in such aggravated cases the originally simple character of the tumour should influence our views as to whether the local and constitutional symptoms presented are really indicative of malignant degeneration, or merely depend upon excessive local irritation and continued discharge. To this point I have already alluded when stating the circumstances which influenced me in my decision to amputate, even when there was glandular enlargement in the axilla combined with the appearance of malignant cachexy. There can be little doubt that even the most simple tumours do, under certain circumstances, occasionally degenerate and assume a malignant character; but, on the other hand, I believe that careful investigation will show that in a great majority of cases the frequency of such alteration in character in simple growths is more apparent than real, and that the peculiar frightful looking ulcerations noticed depend upon the results of excited action in a growth foreign to the organism, the intimate structure of which at least is endowed with no great degree of vitality or power of resistance to diseased action. The enlargement of the neighbouring absorbent glands is readily accounted for from the amount of local irritation, whilst the cachectic appearance of the patient is the result of the constitution suffering from the continued pain and discharge. This is well seen in large fibrous tumours of the mammae, where, the skin ulcerating, fungoid masses are produced, which partially slough, and give rise sometimes to repeated hemorrhages. Such tumours present at first sight a most frightfully malignant appearance, and from the sallow complexion and anxious expression of the patient might readily be mistaken for fungous hæmatodes, unless the originally simple character of the tumour was known, and thus a patient might be left to perish from a disease which can be permanently and easily remedied by a simple operation. I think, therefore, that the original simple character of a tumour ought to form a most important element in judging of the propriety of operating in doubtful cases, and the mere existence of glandular enlargement, or the cachectic appearance of the patient, ought not to deter us from operating unless other circumstances, such as an unequivocal alteration in the character of the tumour or the evident inability of the patient to undergo the operation, contraindicate its performance. Lastly, the dissection of the tumour possesses some interest in regard to the growth and progress of osteosarcoma. Like other simple growths, it has no tendency to involve

the surrounding parts in similar disease, the vessels, muscles, nerves, and tendons, as in this case, pass over or through the diseased mass, and their functions may be impaired by the mere mechanical pressure of the tumour, but they are not involved in its diseased condition. It has been long observed that osteo-sarcoma is limited to the bone originally affected, and does not extend beyond the articular cartilages. A knowledge of this fact enables the surgeon to decide on operations which otherwise would be inadmissible. In the present case the tumour was limited below by the wrist joint, and above by the elbow; the carpal bones, the condyles, and the trochlear surface of the humerus being quite unaffected. The diseased condition, however, has not been limited to the ulna in which it distinctly originated, but has involved the radius, so that both bones of the forearm are inseparably blended together. How has this occurred? Possibly by the lateral enlargement of the ulna near the wrist coming in close contact with the radius, the pressure causing absorption of the periosteum at some point; and the surfaces of bone so brought and maintained in direct contact uniting, and the disease then progressing as in one common structure. But if this can occur between the shafts of two distinct bones, may it not also occur between articular extremities of bones, the cartilage of incrustation being removed, as is partially the case in the articular surfaces of the bones of the forearm in the present instance. Union might then occur between the osseous surfaces so exposed and in contact, and thus we might have extension of the disease propagated beyond the articulation. If such extension ever does take place, however, it must be of very rare occurrence, to judge from the invariably limited character of the disease in the recorded cases, and it would be curious to ascertain to what we are to attribute the circumstance that the disease may involve the shaft of another bone with which it comes in contact, and yet is so constantly limited by the articular surfaces.

CASE II.—Acute Necrosis of Fibula; Hemorrhage; Ligature of Superficial Femoral; Recurrence of Hemorrhage; Amputation; Recovery.

Mr A. T., æt. 23, first began to suffer pain in the left leg about the middle of July 1852; for the first few days he states it was more a feeling of weight and uneasiness than of actual pain. But on the 20th the limb became very stiff and painful, and he had a shivering. After this the pain increased, and Dr Hislop of East Linton was called to attend him. Dr H. states that, from the absence of any symptoms of local inflammation, and from the febrile symptoms being slight, he first thought the pain neuralgic. On the 22d, however, there was an appearance of local inflammation on the outside of the leg, a little below the knee, whereupon Dr Hislop ordered leeches to be applied, and the limb to be fomented. The inflammatory swelling and tension now increased rapidly, and assumed an erysipelatous character, attended with irritative fever and great general constitutional disturbance. Dr H. ordered acetate of lead and opium fomentations to be applied, and made one or two incisions. About the 15th of August he felt fluctuation about the middle of the leg, and made an incision which evacuated some purulent matter. I saw the patient for the first time on Tuesday the 17th August. He seemed much emaciated and exhausted from

irritative fever, pain, and want of sleep. His pulse was 130, and sharp, tongue furred, with red edges, and he had a tendency to dysentery. The affected leg was enormously swollen, red, and tense, contrasting strongly with the opposite leg, which was reduced nearly to skin and bone. On examination, I felt distinct fluctuation deep-seated over the whole length of the fibula, and accordingly I made two incisions about two inches long, the one over the upper part of the fibula, the other above the external malleolus, and also enlarged the incision at the middle of the leg which had been made previously. On passing the finger into these incisions, I at once felt the denuded surface of the fibula, and thus satisfied myself that the whole length of that bone was affected with acute necrosis. A very large quantity of pus was discharged by the incisions. The limb was ordered to be poulticed, and an anodyne draught was administered. I did not see him again till the 28th August; in the meantime the pain and swelling had greatly diminished, but there was still great discharge, and he had become hectic and was exceedingly weak, nervous, and excited, and complained of a sense of oppression in the præcordial region at night. On examining the leg I found a loose sequestrum immediately above the external malleolus, which I readily removed; it composed rather more than half the thickness of the bone. But the dead portions of the upper parts of the shaft had not begun to separate, and from the state of his general health, I felt doubtful of the result. On Thursday, 9th September, as his health was rather worse than better, I proceeded to remove the dead portions, assisted by my friend Dr Duncan.

Dr Hislop having administered chloroform, I passed a probe-pointed bistoury down to the bone, through the incision over the middle of the fibula, enlarged the opening upwards and downwards to the extent of $5\frac{1}{2}$ inches, and extracted a long sequestrum, consisting at one part of about an inch in length of the whole thickness of the bone. I next enlarged the upper incision to the extent of three inches, and extracted another sequestrum, but some small portions seemed still attached to the head of the fibula. There was no great amount of bleeding, and the wound was dressed with dry lint, and supported by a moderately tight bandage. I saw him again on the Saturday, and dressed the wound; there had been no oozing after the removal of the dead bone, and the wound was looking well. As I happened to be residing in the neighbourhood for a few days, his brother called on me on the Monday forenoon following, and told me that he seemed much easier, and in better spirits than for some time back. About ten p.m., however, I received a message from his brother, stating, that on reaching home he had found that alarming bleeding had occurred about a quarter to nine p.m., and that Dr Hislop wished me to come immediately to the case.

I accordingly went, and reached the patient's house about half-past eleven p.m. He had by that time somewhat recovered from the first effects of the loss of blood under the use of stimuli, but was nervous and excited. I learned that the bleeding had taken place slowly and unnoticed until he felt sick; he was talking with his mother and sister at the time, and on his complaining of faintness, they happened to look at the bed, which they found covered with blood; Dr Hislop was sent for, and arrested the bleeding by pressure. Having applied a tourniquet over the femoral artery, I cut up the bandage, and found the leg more swollen than when I last saw it, as if from coagula. I accordingly removed the lint from the large incision in the leg, with my finger removed the coagula, and then with a sponge cleared the large exposed surface. The edges of the wound being held apart, I directed the tourniquet to be gradually slackened, till all compression was taken off the femoral. No jet of blood was noticed. I again examined the wound with my finger, and as the lymph seemed firm, I placed slips of lint into the deep part of the wound, and then a larger compress, and secured them by a roller applied from the toes upwards. An opiate was then given to procure sleep.

I remained at his house all night, and at nine o'clock, before I left for Edin-

burgh, I saw him with Dr Hislop; there had been no recurrence of the bleeding. I was still suspicious, however, from the amount of blood lost, and the long-continued diffuse suppuration which had previously existed, that the fibular artery might have been disorganized and given way from sloughing. I accordingly came back from town as soon as I could, and on reaching Linton I found that bleeding had just recurred to a considerable amount. Assisted by Dr Hislop and my friend Dr Littlejohn, who had accompanied me, I again examined the wound. The extent of the incision enabled me to see the whole deep part of the wound; on clearing which of coagula, I found the textures generally covered with firmly adherent lymph, but some of the deeper parts looked sloughy and unhealthy. The bleeding welled up from the surface of the wound, but not in a jet. The patient's state demanded that some decided measures should at once be adopted, since direct graduated compression had failed. As to direct ligature on the bleeding point, although I suspected the fibular artery, yet, though the large incision exposed the surface of the wound fully, there was no jet or distinct indication of bleeding from any one point, whilst the disorganised sloughy condition of the deep surface of the wound rendered it more than doubtful that a vessel, even if discovered, would have held ligatures. There remained, therefore, only the alternatives of ligature of the femoral artery, or amputation. The latter, from the state of the patient, and the extensive suppurating surface, might ultimately be necessary even for other reasons; but I was very unwilling to sacrifice the limb, and, moreover, from the faint condition of the patient at the time, he would not have been able to bear the operation. I therefore determined to tie the superficial femoral, in order to control the general circulation of the limb, and to assist it by moderate graduated pressure directly applied to the wound. The patient having been brought under the influence of chloroform, I at once proceeded to tie the vessel, which was readily accomplished without removing the patient from bed. All oozing from the wound ceased immediately. Some lint was placed over the wound, supported by a thin flannel roller lightly applied. On the second day after tying the vessel, I saw him again. He was much better, the wound looked healthy, and everything seemed to promise well, as the circulation in the anterior and posterior tibial arteries was fully re-established. All went on well till the 21st September, when I was sent for in the afternoon, as bleeding from the leg had again occurred. I found the patient recovered somewhat from the first effects of loss of blood, which had not been to a large amount; but I felt I could no longer persevere in attempts to save the limb, as any farther bleeding might have proved fatal, since the deep part of the wound was still sloughy, a portion of the necrosed fibula close to the knee had still to separate, and the patient was exceedingly debilitated from the previous exhausting disease, as well as from the hemorrhage. It was decided to amputate the limb at the lower part of the thigh. I had foreseen that this usually simple operation would be complicated in this case, both on account of the greater number of vessels which would require ligature in consequence of the enlargement of the collateral branches after ligature of the femoral, but especially from risk to the deligated artery itself, from any traction exercised on it during the operation, as it was about the period when the ligature begins to separate by ulceration, and accordingly had obtained the assistance of my friends Dr Handyside and Dr Littlejohn. Dr Hislop administered chloroform, and as soon as the patient was under its influence, he was carefully turned round, and drawn towards the edge of the bed, and the limb steadily supported.

Dr Handyside having compressed the common femoral, I removed the limb by double flap above the knee. The mouth of the superficial femoral was readily recognised, but I first secured the enlarged collateral branches, which could not be so completely commanded by compression. Before tying the superficial femoral, Dr Handyside, at my request, relaxed the compression somewhat, and blood flowed from its mouth, but, as might be expected, not in a jet. It was then tied; the flaps were approximated by sutures, and the

stump was dressed. There was little blood lost during the amputation, but the patient was very weak, and it was some time before he fully rallied under the use of stimuli, and he required careful watching during the night to prevent the circulation flagging; indeed Dr Littlejohn and I watched him constantly. Towards morning reaction became fairly established, and he took some food; an opiate was given him, which procured him some refreshing sleep. I returned to town, but took the precaution of leaving my senior apprentice, Mr Rhind, in constant charge, in case of accident, till the femoral ligature came away, as Dr Hislop of course was often engaged with cases at a distance. At first the stump healed very rapidly, except where the ligatures hung out. The ligature of the superficial femoral separated on the 15th day from the time it was applied, or about eight days after the amputation. Subsequently the patient suffered from irritation of the bowels, and one or two attacks of general erythema supervened, beginning on the face, and spreading over the trunk and stump, but gradually, under the use of the tincture of the muriate of iron, and attention to diet, his general health began to amend, and then the stump healed well. Last summer he was in perfect health, and able to walk considerable distances, and still continues, he says, in better health than for many years before his illness.

Dissection of the Limb.—I carefully examined the amputated limb the morning after the operation. I found all the textures covered and matted together with firmly consolidated lymph, so that on removing the gastrocnemius and soleus muscles, no trace could be seen or felt of the posterior tibial vessels and nerve, or of the fibular artery. To avoid all risk of accidental lesion of these vessels during dissection, I cleared the popliteal artery, and being unprovided with a syringe, I passed a long probe gently downwards, so as to guide me in the direction of the vessels. By very careful dissection, I cleared the upper part of the posterior tibial artery, and in doing this I came upon a soft and sloughy portion of lymph, which readily broke down under the handle of the scalpel, and proved to be part of the cyst of a small abscess or cavity about the size of a large filbert, containing pus and grumous blood, in which a portion of the fibular artery lay insulated, and of a dirty green colour. I withdrew the probe from the posterior tibial artery, and passed it gently into the fibular; there was no opening on the posterior surface of the vessel, or that towards the wound. I therefore made an incision so as to remove a considerable portion of the vessels, and surrounding soft parts, so as to be able to examine it more carefully afterwards. On doing so, I found the vessel immediately above and below the small cyst or abscess encrusted (if I may use the term) with firmly adherent lymph; this lymph was continuous with that which formed the walls of the abscess, and opened anteriorly by an irregular ulcerated orifice. On enlarging this opening, so as to expose the anterior surface of the peroneal artery, and on injecting water from the popliteal, a hair-like stream was seen to issue from the forepart of the fibular artery. I then removed the whole anterior portion of the cyst, and found the peroneal artery perforated by a minute ulcerated opening, large enough to admit a bristle. The coats of the vessel, however, were soft, thin, and of a greenish colour, and completely insulated for about an inch, whilst beyond the insulated part the tunics of the vessel were inseparably incorporated with the lymph, so as to defy all attempts to clear the vessel by dissection. Some small necrosed portions of the fibula still remained attached at its upper part.

Remarks.—The principal point of interest in this case is the complication caused by the occurrence of hemorrhage from the ulceration of the fibular artery, in consequence of its being isolated by the suppuration around it. At the same time, to form a correct view of the treatment adopted, it is necessary to keep in mind all the circumstances of the case; for the previous debilitated state of the patient,

from the long-continued irritative fever; the subsequent profuse discharge, hectic, and general exhaustion, together with the disorganized and altered condition of the structures of the affected part of the limb, were all complications requiring to be carefully considered, in deciding on the measures to be adopted when the secondary hemorrhage occurred.

I have said that I suspected that the bleeding might come from the fibular artery, from the relative position of that vessel to the diseased bone, and the unhealthy suppuration around. Hence my first object was to try and secure the vessel directly at the bleeding point. But, on examining the exposed surface, which the extensive incision in the leg readily admitted of, there was no jet of blood or other indication to guide me, while the altered condition of the structures in the wound, the matting together of some parts, and the sloughy condition of others, caused me to desist, as I felt that, under such circumstances, without some direct indication of bleeding, a tedious dissection would be required to reach the vessel, with no certainty of reaching it at the open point; and, after all, my surmise as to its being the fibular artery, might be wrong. Again, if an opening in the vessel were found, its coats might be so unhealthy as not to hold a ligature above and below the opening. The subsequent dissection of the limb proved the difficulties of direct ligature to be even greater than I had anticipated. The portion of the vessel where the opening existed, was surrounded by an encysted abscess, and had only bled indirectly into the wound; hence the reason that no jet could be observed on removing the pressure on the femoral, when examining the wound. The arterial tunics, where they were isolated, were so soft and sloughy, that they would not have held a ligature for a few hours, if at all; whilst immediately beyond the isolation, the whole track of the vessel was so incorporated with adherent lymph, as even to defy its separation to any extent, by careful dissection, when removed from the limb. What probability, then, would there have been of treating the vessel by direct ligature?

As to the method of indirectly controlling the bleeding, by weakening the general circulation through the limb, by ligature of the superficial femoral, no one can be more impressed than myself with its uncertainty, as compared with direct ligature, owing to the free anastomoses in the thigh, and around the knee, above the bleeding point. But when, for the reasons above stated, the latter could not be adopted, I considered it right to give the patient that chance, rather than amputate, as I had seen it succeed in cases of a similar character. I had likewise, by somewhat similar means, successfully arrested hemorrhage from ulceration of the brachial from sloughing, after a severe burn, by tying the third portion of the axillary artery, as recorded in this Journal for February 1848. It is true that in that instance I, at the same time, applied ligatures above and below the wound of the brachial: but these ligatures separated by ulcera-

tion on the 5th day; so that except for the ligature of the axillary artery controlling the circulation, bleeding would have recurred. Hence I felt warranted in trying it in this case; and, indeed, there was little room for hesitation, for the patient was so sunk from the recent bleeding, as to put immediate amputation out of the question; and as oozing was still going on, and direct pressure had failed, something required to be done.

There can be no doubt, I think, as to the generally admitted propriety of giving preference to direct ligature above and below the opening, in all cases of wounded arteries, as a great general rule, and it is one which can scarcely be too much insisted on; but at the same time, we must keep in mind that there are exceptions to this, as to all other general rules, and that much must depend upon the state of the vessel opened. If its coats are diseased and sloughy, if their vitality and that of the surrounding parts be impaired, as after extensive unhealthy suppuration or severe burns, then direct ligature, if trusted to alone, without controlling the force of the circulation by ligature on a healthy point of the vessel higher up, must often prove abortive, and repeated hemorrhage from rapid ulceration of the deligated part of the artery be the result. In fact, everything depends upon the state of the arterial tissue in the neighbourhood of the lesion, and the probable destructive power of the agency producing it. I have instanced burns by fire; on the other hand, ulceration from caustics generally leaves the parts, whence the slough has separated, healthy, and curiously enough, the very patient, whose case I have just narrated, nearly lost his life on a previous occasion from ulceration of the radial, caused by nitrate of silver applied to a bite. On that occasion I also saw him, but, knowing the limited action of the caustic, I exposed and tied the radial above and below the ulcerated point with success. But it would have been a very different matter in the sloughy condition of the fibular in the present instance, even if there had been any indication to guide me to the bleeding point. In the present case, the ligature of the femoral did effectually prevent all hemorrhage for a time; it allowed the patient time to rally; and when, on the circulation being fully established, the bleeding recurred, it was both less active and less in amount, and had the patient been even tolerably strong, I doubt not but that moderate and regulated pressure might have ultimately succeeded in arresting further hemorrhage. But, debilitated as he was by the previous exhausting disease and the repeated bleeding, and peculiarly depressed by the fear of hemorrhage from a remembrance of the risk he formerly ran, I felt that even a very trifling loss of blood might prove fatal, and the danger to life seemed so great, as to forbid any further attempts to save the limb.

CASE III.—*Disease of Bones of Tarsus; Amputation at Ankle Joint: Recovery.*

M. Rigali, ætat 25, when a boy, had suffered from disease of the os calcis; portions of diseased bone were removed at that time, the wound healed and continued well until the present attack. About five weeks prior to my seeing

him, he felt pains in the foot which soon became very acute ; the foot became inflamed and swollen, and he was treated for erysipelas, but without relief. I saw him for the first time on the 9th of February 1852. The foot was swollen, tense, and of an erysipelatous appearance ; he was suffering from irritative fever, pulse 120, dry-furred tongue, great general depression and exhaustion from want of sleep. The local pain was most severe over the region of the heel, but extended generally over the foot. From the history of his case, I felt satisfied that the symptoms depended on disease of the bones, and this opinion was confirmed on introducing a probe into an opening at the old cicatrix on the heel, when I felt the bone bare for a considerable extent. On grasping the anterior part of the foot and moving it laterally, the tarsal bones were distinctly felt grating on each other. As there was much tension and inflammation over the dorsum of the foot, I made two longitudinal incisions, which gave vent to unhealthy purulent matter, and the probe introduced into these incisions at once passed down into the diseased bones. I ordered him an opiate draught, and directed the foot to be dressed with lint dipped in warm water, and covered with gutta percha membrane. Next day the pain, swelling, and redness of the foot were diminished, and there had been a considerable discharge of fœtid pus. I directed the foot to be enveloped in a large poultice at night, the warm water dressing to be continued during the day, and directed him to have an opiate at bedtime to procure sleep, and also to arrest diarrhœa, which had commenced. The tension and inflammation gradually yielded to this treatment ; but profuse fœtid discharge continued, with great pain on the slightest movement of the foot or leg, and the irritative fever subsided into hectic, with loss of appetite and profuse perspiration, alternating with diarrhœa. The use of quinine and sulphuric acid, with wine and beef-tea, was had recourse to, in order to support his strength till the erysipelatous form of inflammation, which had involved the leg, was sufficiently subdued to allow me to remove the foot. Having obtained his consent to the operation, I amputated the foot at the ankle-joint, on the 18th February. Owing to the previous inflamed state of the parts, a very considerable number of vessels required ligature. The stump was covered with lint dipped in cold water, and an opiate given. He complained a good deal of smarting pain in the part, but slept better after the operation than he had done for some weeks. There was no tendency to erysipelas attacking the stump, which healed very well. His general health improved steadily, though at first slowly, and at the end of two months he was able to walk about on the stump. He has since continued in excellent health, and is able to walk considerable distances without difficulty.

Dissection of the Foot.—On examination the whole of the tarsus was found more or less affected with caries, whilst the os calcis presented extensive necrosis of its outer fibrous lamella, as did also some of the other bones. The part of the os calcis from which portions had been removed when the patient was a boy, seemed firmly healed by deposition of new bone, and that part did not seem affected by the more recent disease.

CASE IV.—Necrosis of Head of Tibia ; Secondary Affection of Knee-Joint ; Amputation ; Accidental Attack of Scarlatina ; Death.

On the 20th October 1852, I was requested by Mr Falconer, surgeon, Loanhead, to visit J. B., residing at Lasswade, on account of disease of the left knee-joint. On seeing him with Mr Falconer, I found the knee much swollen ; over the upper part of the tibia the skin was discoloured, and an opening surrounded by unhealthy granulations led into a cavity in the head of the bone, the walls of which felt rough, and the probe detected some loose portions of dead cancellated texture. There was considerable boggy swelling and redness over the knee-joint ; but the principal swelling was evidently caused by great effusion into the cavity of the joint, the patella moving on the surface of the deep swelling. Some years prior to my seeing him, he had had an operation performed for removal of a sequestrum from the head of the tibia, and after its

removal continued well for a considerable period, but from time to time he suffered from severe pains in the head of the tibia; the cicatrix opened up, discharged matter, and then a temporary relief occurred. Of late, however, the pain had been very severe. About three months before I saw him, swelling and pain began in the knee-joint, attended with febrile irritation and loss of sleep; and for some weeks before my visit, his health had been rapidly sinking from hectic. His pulse was 130 and weak, besides the swelling of the knee, the affected limb was œdematous, and he suffered intense pain on pressure or movement of the knee. His extreme weakness and the œdematous state of the limb gave me an unfavourable opinion of the case; but as both he and his friends were anxious he should have the chance of relief afforded by removal of the limb, I amputated it at the middle of the thigh, by double flap, on the 25th October. During the operation a large escape of serum from the cellular tissue took place, but he lost little blood. He was directed to have forty drops of morphia, when the effects of the chloroform should have passed off. I saw him on the third day after the operation, and dressed the stump, removing some of the stitches, and applying adhesive straps to support the flaps. His pulse was still quick, about 120, but he stated that he had slept well. His bowels had been opened, and he passed water freely of natural appearance, and not coagulable by heat. His tongue was furred and rather glazed on the edges and tip. I was informed that one of his children had taken scarlet fever (then very prevalent) on the evening of the operation, but that the child had been kept away from him in a different room. On the next day I heard from Mr Falconer, that B. had had a slight shivering and complained of sore throat, and that towards the following morning the eruption of scarlatina appeared over his body, accompanied with increased sore throat, very rapid pulse, and delirium, and he gradually sank and died on the sixth day after the operation.

Dissection of the Amputated Limb.—On examining the joint I could not by pressure on the knee succeed in causing the contained fluid to pass out by the opening over the head of the tibia. On opening the joint it was found filled with turbid glairy fluid mixed with pus; the cartilages had suffered but little, there was great injection of the synovial membrane, with patches of recent lymph, and considerable gelatinous deposition near the lateral ligaments on each side. On opening the cavity in the head of the tibia, it was found to contain a portion of dead cancellated texture lying loose; the walls of the cavity were of a pale brown colour, and at some points covered by a lardaceous looking substance. On carefully passing a probe upwards, it was found to pass into the knee-joint through an ulcerated orifice with round thick edges, but overlapped internally by a fold of the synovial membrane, which had acted as a valve, preventing fluid from passing out of the joint when pressure was made on the knee.

CASE V.—*Caries of Os Calcis; Previous Operation for removal of Diseased Bone; Amputation at Ankle-Joint; Recovery.*

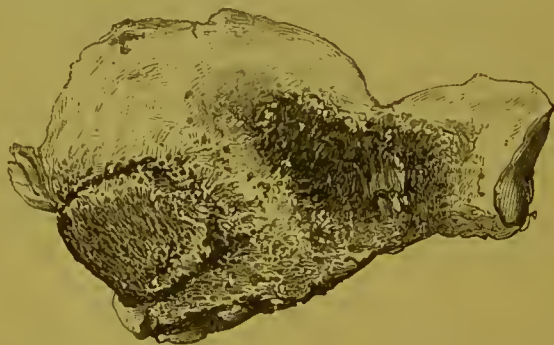
In May last, I was requested by Dr Thomson of Dalkcith to visit Mr L., who was suffering from disease of the os calcis. I was told that for some time previously he had been under surgical treatment, and that an operation had been performed with the view of removing the diseased portion of the bone, but that the wound had never healed. The pain had become intense, scarcely alleviated by large opiates, to which he had recourse; and his general health was evidently sinking under the continued irritation. On examining the foot, I found the soft parts about the heel and ankle swollen, discoloured, and excessively painful on pressure. Deep-seated fluctuation was felt on the plantar aspect of the os calcis, on the posterior and outer side of the heel there was the cicatrix of a crucial incision still partially open, and discharging thin fetid pus. On introducing a probe into the sinus, it passed readily round the os calcis, which felt rough and bare, and at one point it

penetrated the substance of the bone itself. The general health of the patient had suffered greatly, both from the irritation of the disease, and also from his excessive use of laudanum. His pulse was 140, and weak; he was greatly emaciated; whilst his appetite and digestive powers were much impaired. He stated his age to be fifty, but appeared to be considerably older.

On taking all the circumstances of the case into consideration—that the previous operation for the removal of the diseased portion of bone had proved abortive, that in all probability the greater part of the os calcis was involved in the disease, together with his age, debilitated constitution, and the risks of further partial operations, I proposed amputation at the ankle joint. He willingly consented to this, and I performed the operation on the third of May. The existence of the cicatrix of the former operation appeared rather unfavourable to the ordinary plan of operating; but any difficulty from that cause seemed more than counterbalanced by its advantages over other methods. I therefore operated as usual, and experienced little or no difficulty from the adhesions in separating the flap from the os calcis. The stump progressed favourably, but erysipelas appeared on the seventh day on the anterior part of the leg, and required incisions to be made to relieve the tension, and evacuate purulent matter. A considerable portion of the tendon of the tibialis anticus sloughed, and when this separated, the tendency to erysipelas disappeared, and the case went on favourably. The opiates were gradually withdrawn by diminishing the doses, and this was soon followed by a marked improvement, as regarded his appetite and general health. The discharge continued for some time from the orifice of the old cicatrix.

The stump is now solid and well formed, and can bear considerable pressure, though the patient complains of the weight of the artificial limb.

Dissection of the Amputated Foot.—On examination, the disease was found to be confined to the os calcis, with the exception of a slight ulceration of the cartilages of the corresponding surface of the os cuboides. On looking at the os calcis, its posterior and external surface was nodulated and rough, from the development of new osseous matter. Immediately below the insertion of the



tendo achillis, a circular black portion was observed, and on making a longitudinal section of the bone, this was found to be a circumscribed sequestrum of the cancellated texture; whilst at the anterior part of the bone was a carious cavity, containing portions of partially dead cancellated texture, as shown in the accompanying woodcut.

The pale brown colour and general appearance of the ulcerated surface in contact with the sequestrum, indicated its weak vitality and carious character, whilst at some points the cancellated texture had become dense and hard.

Remarks.—These three cases afford examples of certain peculiarities attendant on necrosis, occurring in the cancellated texture of the short or heads of the long bones, which renders that condition

in it less amenable to treatment by removal of the sequestrum, than similar disease occurring in the shafts of bones. At first sight, this appears contrary to what we might expect, for whilst the looser texture of the cancellated structure would seem less likely to suffer from the pressure of abnormal congestion or exudation than the denser structure of the shaft, its larger amount of vascular supply would also lead us to expect not only a greater degree of vitality and power of resistance to disease, but likewise of reparative power after the sequestrum was removed. I think the unsatisfactory result of operations for the removal of sequestra, and the recurrence of disease so frequently met with in such cases, are mainly attributable to a peculiar condition of the bone in patients of a scrofulous diathesis, predisposing it to disease, and rendering it less capable of reparative action. The condition I allude to is well seen in cases where amputation has been performed for disease of several of the tarsal bones. In such cases we generally find not only that parts of the diseased bones, but that other bones, not affected by positive disease, exhibit this tendency to degeneration. On making a section of such bones, we find the cancellated texture more opened out than usual, and filled with a peculiar lardaceous deposit or altered medulla; at other times by a deposit of cheesy or tubercular consistence, varying in colour from a white to a dark reddish brown. At other points, we often find the cancellated texture obliterated, and its place occupied by a dense hard structure, similar to what has been noticed in dental caries. Most generally, however, the bone is opened out and softened in texture; whilst in most cases the outer fibrous lamella is attenuated to a mere shell, and often perfectly diaphanous.

When actual disease does occur in a texture so altered in structure and impaired in vitality, its character must necessarily be of a low type, and with little tendency to repair. Hence if, under such circumstances, a portion of the cancellated structure be deprived of its vitality, and form a sequestrum, on its removal by operation, it does not leave behind it a healthy granulating surface, but a surface of bone affected by a weak form of ulceration. In fact, there seems little doubt that necrosis occurring in the spongy texture of bone, is, in the great majority of cases, the result of a form of interstitial caries, in which the ulcerative process has so isolated a portion of the cancellated texture, that it perishes—the original diseased condition still existing, to a greater or less degree, in the immediately surrounding parts.

The section of the os calcis in L——'s case shows this condition in the bone surrounding the sequestrum at the heel, whilst more anteriorly and distinct from it, we have another carious cavity, showing the predisposition to disease. From this state of matters, we can readily understand how, after the removal of one sequestrum, other portions of the cancellated texture, after a time, perish from the continuance of the morbid action, necessitating further

operative interference, or leading to secondary disease of neighbouring articulations, as in B——'s case, where the carious cavity contained a new sequestrum, and by ulceration had opened into the knee-joint. At the same time, whilst these considerations modify our prognosis as to the favourable result of operations for the removal of sequestra, or portions of diseased bone in the class of cases referred to, in practice we must have recourse to them, as in many cases we cannot be perfectly certain as to the extent of the disease, and it is evident we are not warranted in resorting to amputation till we have first given a fair trial to less severe measures for removal of the diseased portions of bone, which in many cases may prove sufficient. The case of Rigali seems to be an instance of this strumous condition in the bones of the tarsus, leading to a mixed form of extensive caries, and necrosis of acute character, and attended with local and constitutional symptoms similar to what we meet with in acute necrosis of the shafts of the long bones.

CASE OF CHOLERA,

IN WHICH

THE BLOOD WAS REMARKABLY ALTERED.

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SINCE the researches of Bennett and Virchow, on the structural alterations of the blood, every observation connected with that subject has acquired a degree of interest hitherto unknown. Hence the following case, though an isolated one, may not be undeserving attention :—

Mrs G., æt. 51, wife of a shoemaker, living in No. 48, Candlemaker Row, was admitted into the Edinburgh Cholera Hospital at 1.5 p.m. of the 8th of February 1854.

Immediately thereafter I found her pulseless at the wrist, complaining of cramps in the calves of both legs, recurring every four or five minutes, and when present, giving rise to great pain. She had also, almost incessant purging and vomiting. The stools presented the usual appearances of rice-water discharges, and the matter vomited seemed to contain some bile. The surface of the body generally felt cold, the skin doughy, the tongue and breath were also cold, the former being coated with a thick brown fur. She had a peculiar sunken expression ; countenance of a deep sallow tint ; eyes much depressed in the orbits, and surrounded by a very pronounced dark areola. The voice was very weak, almost whispering.

At 10 o'clock p.m. of same day, the heat of surface is reported as good ; the pulse barely perceptible at the wrists ; occasional vomiting ; excessive thirst ; purging almost incessant. She has made no water. It is doubtful when urine was last passed—according to her own account, not since the day of seizure, four days before admission.

Feb. 9th, 10 A.M.—Had slept during the night ; vomiting is abated ; purging continues much the same. Pulse small and thready, but quite perceptible ; temperature good ; thirst not so urgent. 2 p.m.—Pulse evidently rising in strength. I drew off by catheter about 5ij. of turbid dark-coloured urine, which was found highly albuminous, and presented the same reaction on the addition of nitric acid, as Dr Parkes has pointed out in the urine of cholera. 11 p.m.—Pulse is described as of natural strength, 96 per minute. Within the last two and a half hours has had three stools, chiefly fluid of a dark green colour, and containing a very small proportion of solid flocculent matter. Other symptoms have disappeared.

Feb. 10th, 2.30 A.M.—I was sent for very hurriedly, being told a great change had almost instantaneously come over this patient. On arriving at her bedside, I found her face of a death-like paleness; respiration very slow and tranquil; pulse quite imperceptible, the pulsations of the heart even being scarcely recognised by the hand applied over the pericardial region. The extremities were cold; she had no vomiting. After some doses of diffusible stimulants and dry frictions steadily applied to the chest and extremities, she somewhat rallied, and at the end of an hour, heat having returned to the extremities, the pulse being quite perceptible at the wrists, and the expression of extreme debility partially gone, I left her. Another half hour had scarcely elapsed when the nurse returned saying, "the patient was dying." I again found the same alarming phenomena as before. In addition, there were now an occasional rattle in the chest, a glazed appearance of the corneæ, and the eye-balls were turned upwards. She expressed a fear of impending dissolution. Through the œsophagus tube (for swallowing could be effected but with great difficulty) I poured some brandy and beef-tea. It, however, had no effect in rousing the depressed energies of the system, and at 4 A.M. of the 10th she quietly sank.

Treatment.—This consisted of the hot-bath soon after admission, frictions with anodyne liniments, to allay cramp, and one of Dr Steven's saline powders every half hour; the first six were rejected, the rest were retained. She had also occasionally turpentine and saline enemata.

Preceding history.—The most of the following particulars I learned from her daughter. Mrs G. has had no children since her 28th year. During the last six years she has led a very dissipated life, being in the habit of spending the greater portion of her husband's wages in procuring whisky; she has enjoyed but very scanty fare. Her daughter described some kind of fits to which her mother, when very intoxicated, was subject; the description was rather vague, but somewhat analogous to that of epilepsy. She never had attacks of syncope. Her legs and ankles sometimes became swollen to such an extent as, to allow of the entrance of her feet, the shoes had to be cut. For the last eighteen months she has been subject to attacks of diarrhœa and nausea, being so affected at least twice or thrice every month. She never complained of palpitation at the heart. Eight days before admission into the hospital, she and her husband, both at the time suffering from diarrhœa, went down to Leith to attend a son-in-law, who, they were told, lay ill of cholera. They remained by their son-in-law's bed four days and nights, at the end of which time, convalescence appearing established, they came home to Edinburgh. Soon after their arrival the husband was seized with the symptoms of severe Asiatic cholera; and next day Mrs G. was attacked with cramps, vomiting, purging, etc. In the flat at Leith above the son-in-law's house, two men died of cholera the week previous to the illness of their relation. This is authenticated by a medical gentleman of Leith.

Sectio cadaveris—Nine hours after death.

Rigor mortis inconsiderable; peculiar sallow tinge of body; little posterior lividity; one and a half inches of fat in the abdominal parietes.

Head.—Considerable congestion of posterior portions of hemisphere of brain; considerable amount of sub-arachnoid effusion not coagulated.

Chest.—Pleuræ moist; lungs highly emphysematous, and very anæmic; both together weighed not more than 1 lb.; bronchi of both contained some frothy mucus; their lining membrane appeared of a rosy tint.

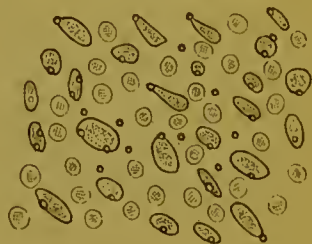
Pericardium contained a little fluid quite clear; one small spot of ecchymosis not exceeding the size of a pin's head was seen at the base of the right ventricle.

Right side of heart fully distended; left comparatively empty; cavities contained dark thick blood, semi-coagulated; some of the coagula were partially decolorized, and extended into the larger vessels; valves healthy; heart when emptied seemed small, especially when contrasted with the size and condition of the patient; its fibre was not fatty.

Abdomen.—Liver weighed 2 lb. 11 oz.; it was not at all congested, of a rather fawn colour, and of softer consistence than normally; gall bladder contained about two ounces of a thin green bile; spleen weighed $4\frac{1}{2}$ oz.; it appeared of normal size, but felt softer than in a state of health; on section it presented a homogeneous mass, of a colour which can only be described as deep brown black, with a shade of vermilion (mahogany colour); not a trace of the healthy structure of the spleen; no malpighian bodies could be observed; stomach and intestines healthy; mucous membrane very pale, nowhere injected, except a small portion of the lower end of the descending colon (consequence of enema).

Kidneys together weighed $9\frac{1}{4}$ oz.; right kidney was congested; external surface slightly irregular, presented portions of atrophied texture and a few small cysts; tubular character of cortical substance not very distinct; the left, on section, showed some cysts; consistence firm; otherwise healthy. Urinary bladder firmly contracted; mucous membrane injected and thrown into rugæ; external surface of cervix uteri showed a rough, irregular ulcer, of an oval shape, extending nearly all round the os; no thickening of the adjacent tissues; on pressure some gelatinous mucus escaped from the os; lining membrane of uterus, near fundus, injected; ovaries normal.

Microscopic Examination.—On examining a drop of the blood under a power of 240 linear diameters, the red corpuscles appeared very faint; seemed to contain little, if any, colouring matter, and did not present, as is their wont, the characteristic appearance "of rouleaux's of coin." The white corpuscles seemed to bear a normal proportion to the red. A few granules were seen here and there in the field of the microscope. In addition to these, however, were numerous other bodies, which could not fail to attract notice—generally circular in shape; some, however, oviform; a few caudate, and composed of a well defined membrane, not at all puckered, enclosing one or two distinct granules; these were very small, quite round in form, and possessed of clear centres; they appeared to be attached in general to one of the extremities of the circumference of the corpuscle; in some cases it was difficult to say whether they were adherent to its interior or exterior. When observed in motion some of these bodies appeared as if flattened on either side. They seemed to bear the proportion of one to seven or eight of the red blood corpuscles. The long diameter of the corpuscles measured about the 100th of a millimetre; their transverse 150th of a millimetre.



The corpuscles observed in the blood. The fainter bodies, which are the normal corpuscles partially dissolved, have been drawn by the wood-cutter rather too small—240 diam. lin.

On the addition of acetic acid they gradually swelled up, their external wall becoming fainter and fainter, until at last it appeared to rupture, and the included granules were set free. The acid, with the exception of rendering the granules more faint, had no other effect. A strong solution of muriate of soda diminished the size of the corpuscles, rendering them more distinct. On adding aq. potassæ the corpuscles increased in size, their external wall becoming fainter. In the tissue of the liver the same bodies were seen, identical in appearance and behaviour under chemical reagents; the true hepatic cells were healthy. In the tissue of the heart, amid the muscular fibrillæ, similar bodies were observed. The same bodies, with the exception of a few true spleen corpuscles, were seen to constitute the whole mass of the spleen. In this instance they appeared rather larger in size than in the blood, and presented a much greater diversity of shape—the caudate being the most predominant form—at the extremity of whose tail-like projection, a nucleus could be observed as if pushing the cell wall before it.

Remarks.—It was observed at the time of the examination of the

body of this woman, "there was not a single morbid appearance which could be held as accounting for the cause of death." And it cannot fail to attract notice, that although we had all the most characteristic phenomena of true Asiatic cholera developed during the lifetime of the patient, we did not discover after death one of the usual morbid appearances, such as they are, met with in the bodies of individuals, the subjects of malignant cholera.

Various questions of great interest arise from the study of the case, which, I regret to say, are difficult of solution. In the first place, what led to these bodies? How is their presence to be explained?

Only three hypotheses are admissible—1st, This diseased state existed antecedent to the attack of the fatal disease; 2dly, It was the result of the morbid influence of the cholera itself; 3dly, It was consequent on the treatment employed. Now, it seems to me the first of these is the most probable explanation. This becomes apparent when we pass in review the preceding history of the patient—her delicate state of health, irregular habits of life, liability to diarrhœa and sickness; when we consider the peculiar appearance presented by the spleen, quite unusual in Asiatic cholera, and the mode of death, which also is comparatively rare, we can come to no other conclusion, but that these bodies, found in the blood and tissues, unconnected with the essential disease "cholera," nevertheless had a powerful influence on the disastrous issue of the case. The other hypotheses, I regret to say, from want of data, I can neither support nor refute. They form proper subjects of inquiry.

In the second place, what are these bodies? That they are, in some mode or another, connected with the blood is incontestible, from their being found in that fluid, and so universally amid the other tissues of the body, as can be explained on no other hypothesis. Are they, then, a modification of the red corpuscle? Are they an early or retrograde stage in the development or decay of the white blood corpuscle? Or have they any other relation to these bodies? I regret to say I have no answer to give these questions. All I can do in the meantime is merely to chronicle the fact of such bodies as described having been found in the blood and tissues of a woman who died presenting the true Asiatic type of cholera, and concurrent with a peculiar state of the spleen.